Testing and Facilities
NREL High-Flux Solar Furnace

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Concentrating Solar Power (CSP) Peer Review

November 7, 2001

CONCENTRATING SOLAR POWER

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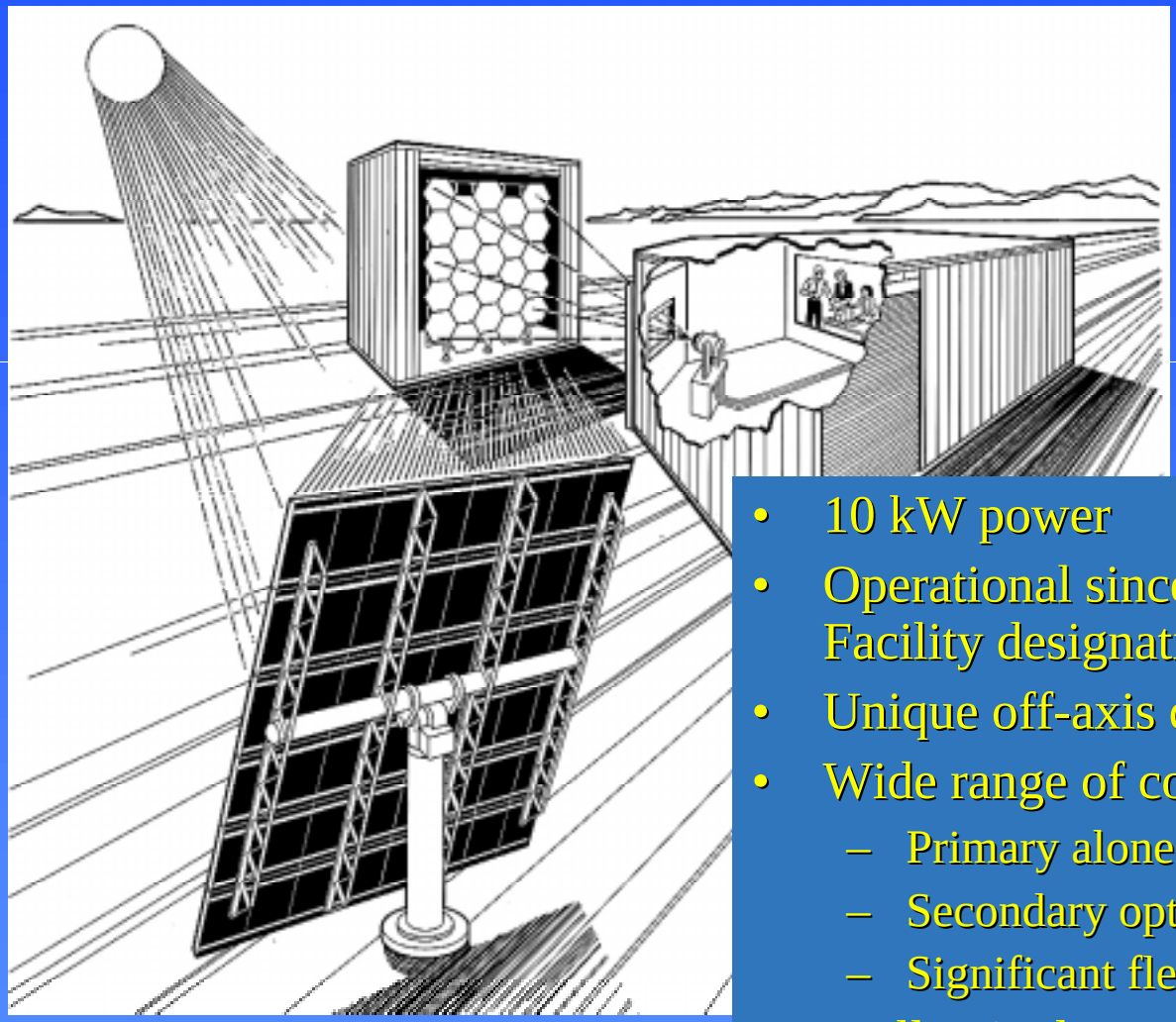
Sandia National Laboratories, Albuquerque, NM
National Renewable Energy Laboratory, Golden CO

NREL's High-Flux Solar Furnace



- 10 kW power
- Operational since 1989, National User Facility designation in 1993
- Unique off-axis design
- Wide range of concentration
  - Primary alone: 250 W/cm^2
  - Secondary optics: 2,100 - 5,000 W/cm^2
  - Significant flexibility
- Well-suited to R&D projects
- Multi-program facility

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Mesa Top Test Facilities

SAIC Dish

HFSF & Small Dish Test Area

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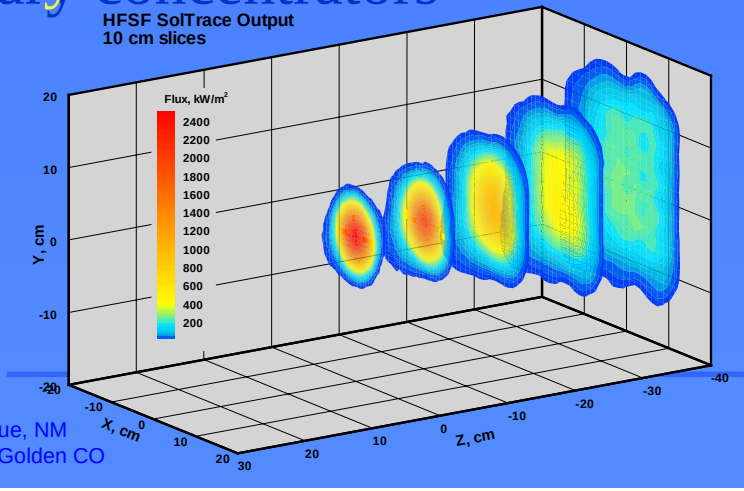
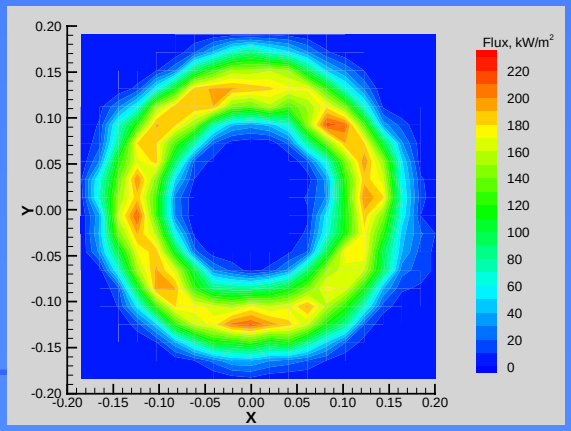
Unique Capabilities

- Flux distributions can be easily tailored to the application
  - Control of flux level using attenuators
    - Plate or Venetian blind
  - Aiming strategies
    - Primary mirror
    - Secondary concentrators





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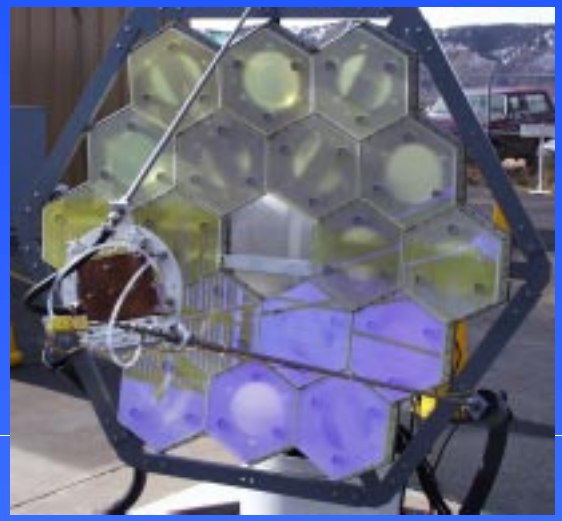
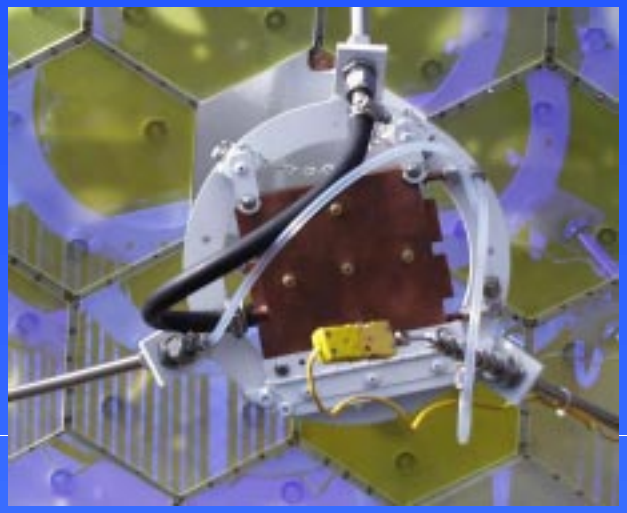
Additional Facility Applications

- Other DOE Programs
  - Ultra-accelerated exposure testing
    - IPP: commercial prototype hardware development
    - Solar Heat: flat plate collector glazing testing
  - Hydrogen: methane splitting for H_2 production

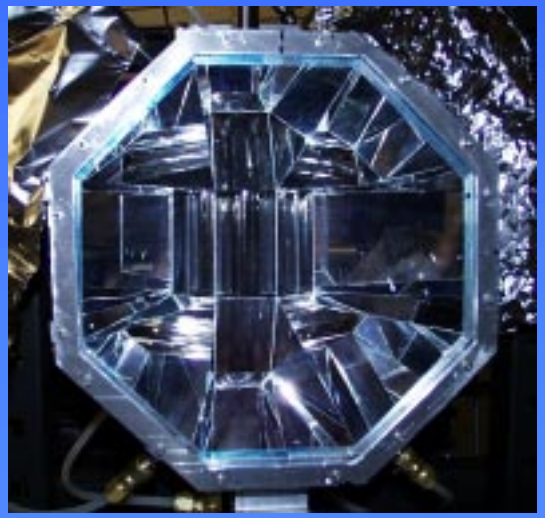
- Work for Others
  - Northrop-Grumman (flux gauge calibration)
  - Spectral Engineering, Inc. (B2 PTPS testing)

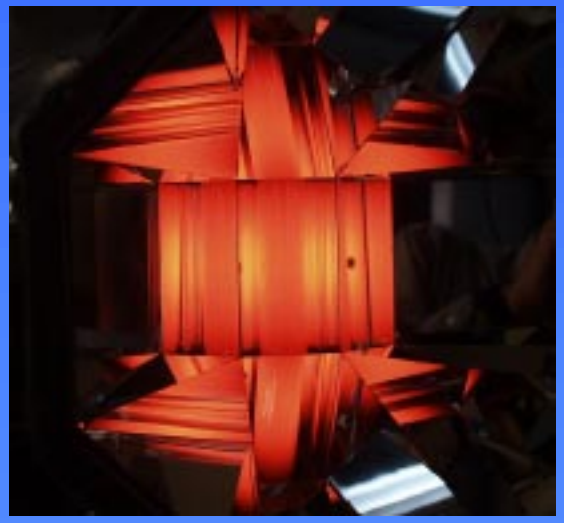




UV Concentrator

H_2 Reactor





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Opportunities and Issues

- Expand WFO projects
  - Generally not much money, but can open new doors
- 10 kW small by solar furnace standards
  - limits work to small prototypes
- Aging hardware
  - No major replacements in 11 year life
    - Problems solved with duct tape, solder and compromise
  - Budget barely covers ES&H and O&M
    - Capital equipment budget rarely available

On the Far Lighter Side

How We Get Started

"Say … now *I'm* starting to feel kinda warm!"

How We Finish

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